



ENIGMA 8th meeting
6 – 8 September, 2006
Helsinki, Finland

The multi-wavelength polarization VLBI
structure of 3 BL Lacertae objects

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Introduction

•1308+326

- Intensity and polarization model fitting;
- Helical B Field in the jet?
- Polarization rotation in 43 GHz.

•0828+493

- Intensity and polarization model fitting;
- Helical B Field in the jet?

•1803+784

- Intensity and polarization model fitting;
- Helical B Field in the jet?
- RM gradient in the jet.

1308+326
(November 2002)

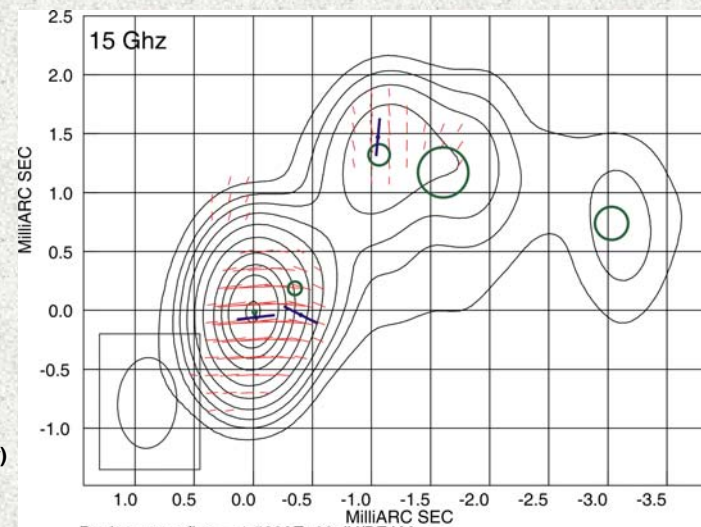
1308+326. Model fitting.

15 GHz map Intensity (mJy)

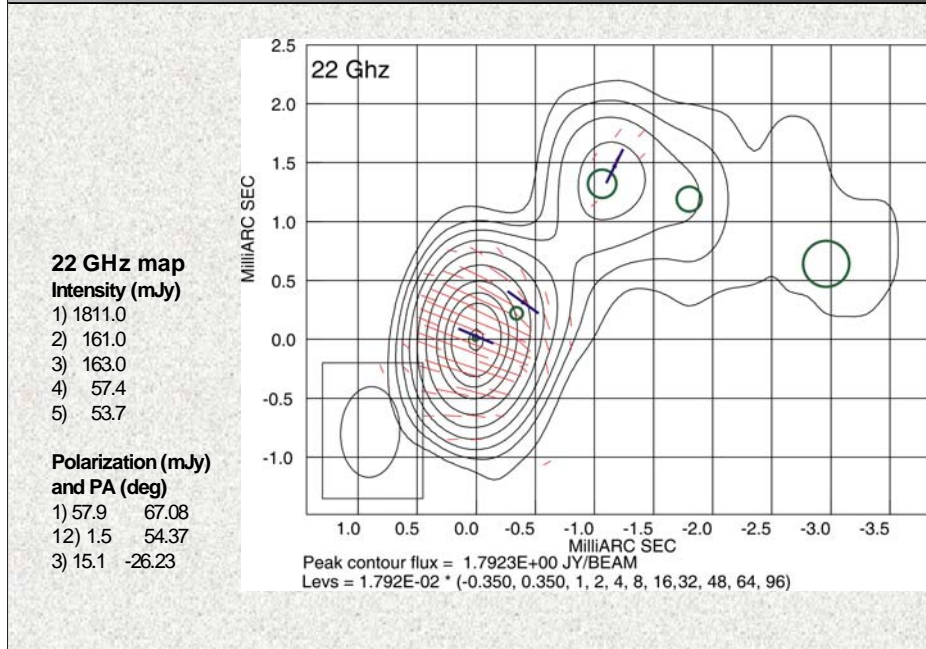
- 1) 1510.8
- 2) 184.1
- 3) 137.0
- 4) 148.0
- 5) 44.9

Polarization (mJy) and PA (deg)

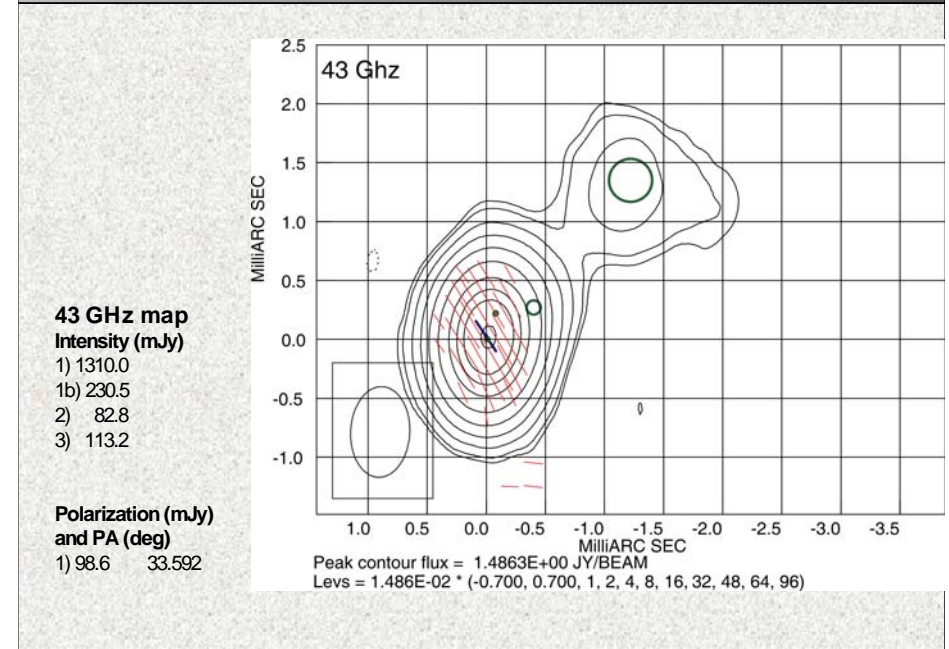
- 1) 57.9 96.578
- 2) 10.9 63.087
- 3) 18.5 -5.44



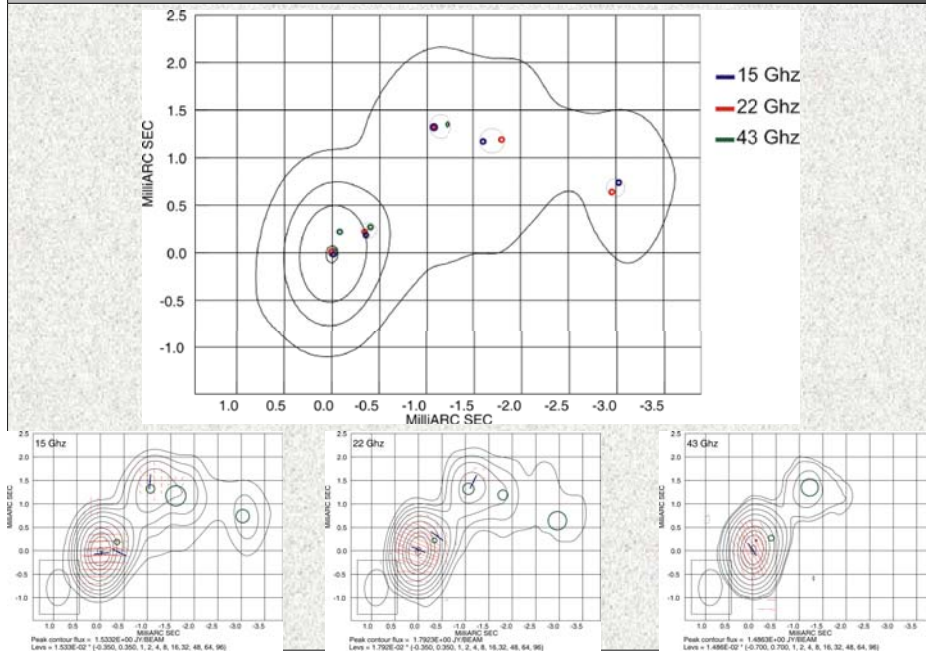
1308+326. Model fitting.



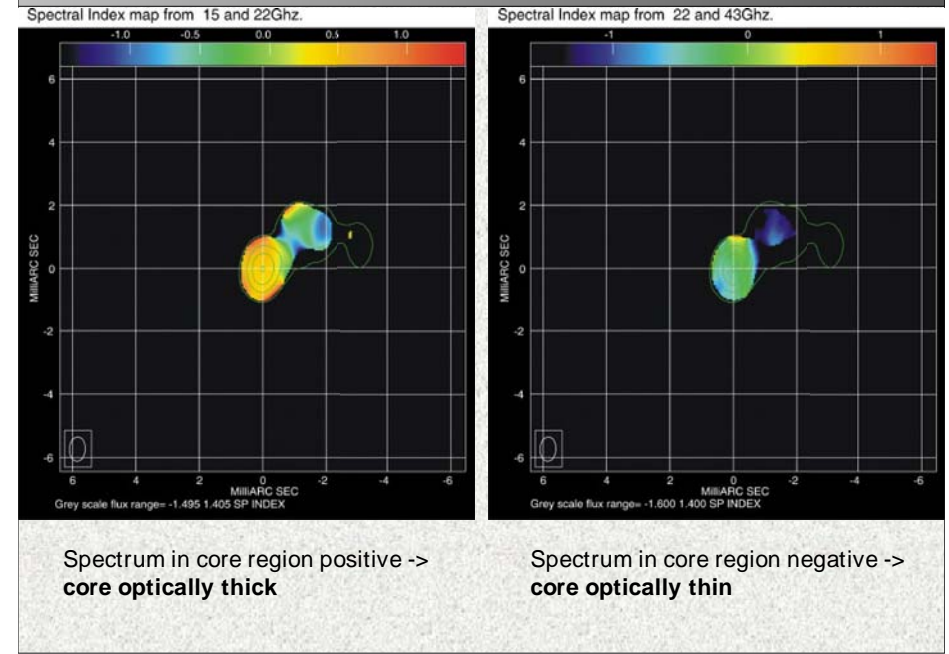
1308+326. Model fitting.



1308+326. Model fitting.

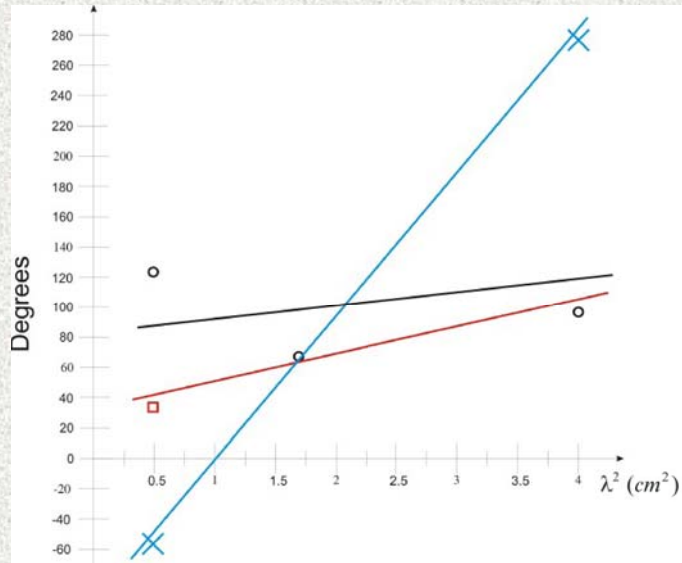


1308+326. Spectral index maps.



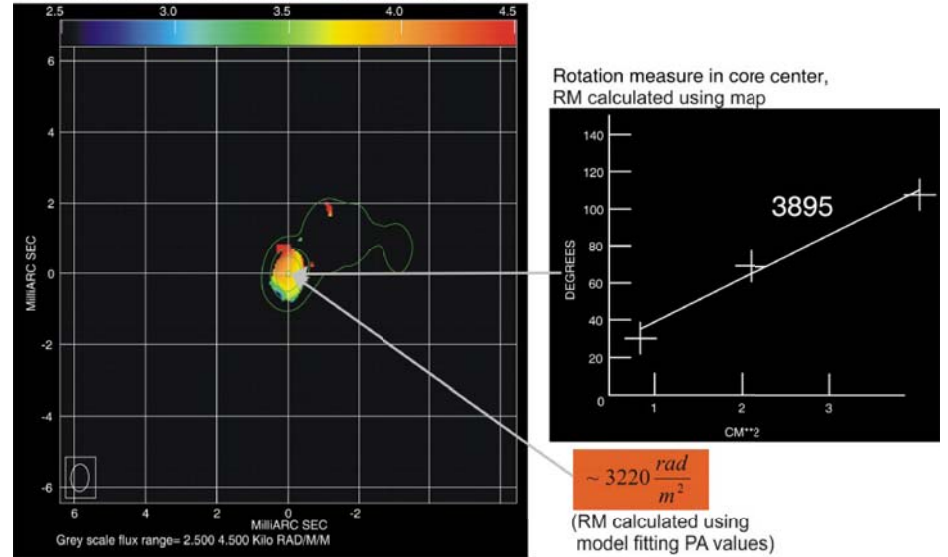
1308+326. Rotation measure.

Why we rotate polarization angle in 43 GHz to 90°?



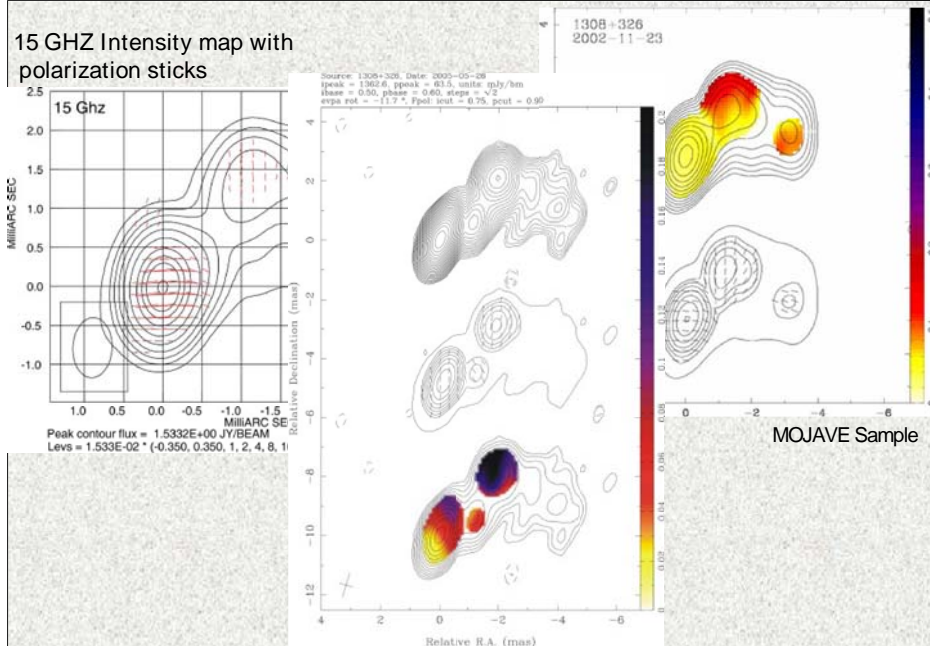
1308+326. Rotation measure.

Rotation measure map made from 15, 22 and 43 GHz.



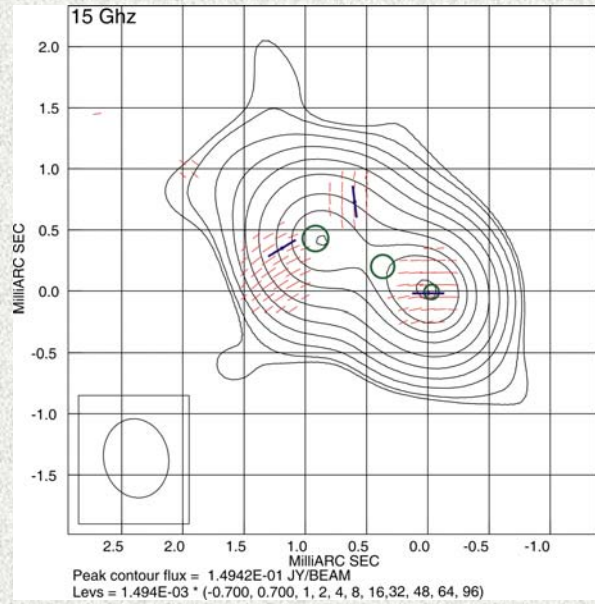
1308+326. November 2002 epoch compare with MOJAVE data.

15 GHz Intensity map with polarization sticks



0828+493
(November 2004)

0828+493. Model fitting.



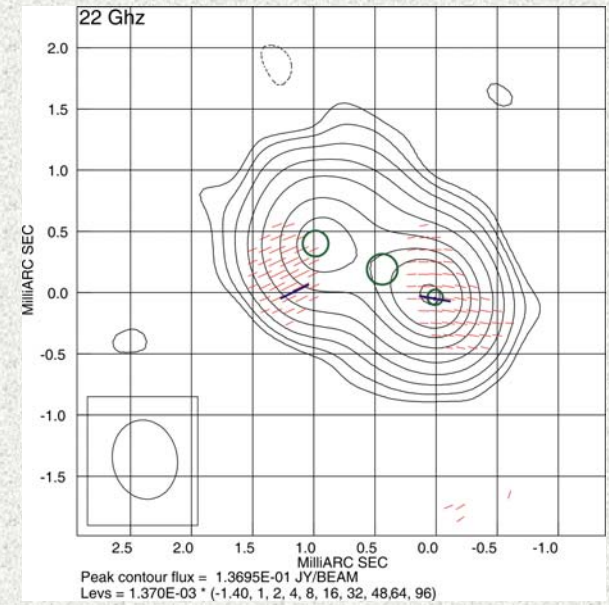
15GHz map
Intensity (mJy)

- 1) 153.4
- 2) 65.9
- 3) 134.8

Polarization (mJy)
and PA (deg)

- | | |
|--------|---------|
| 1) 2.3 | 94.132 |
| 2) 2.9 | 121.132 |
| 3) 2.4 | 7.132 |

0828+493. Model fitting.



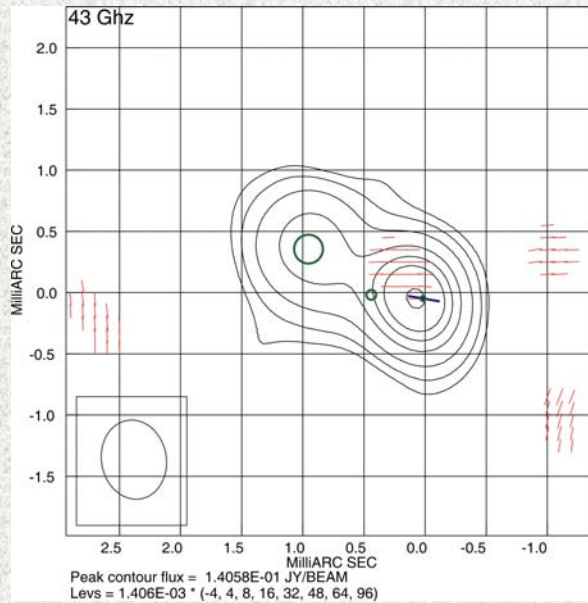
22GHz map
Intensity (mJy)

- 1) 143.6
- 2) 79.2
- 3) 100.2

Polarization (mJy)
and PA (deg)

- | | |
|--------|--------|
| 1) 2.2 | 80.06 |
| 2) 3.2 | 116.06 |

0828+493. Model fitting.



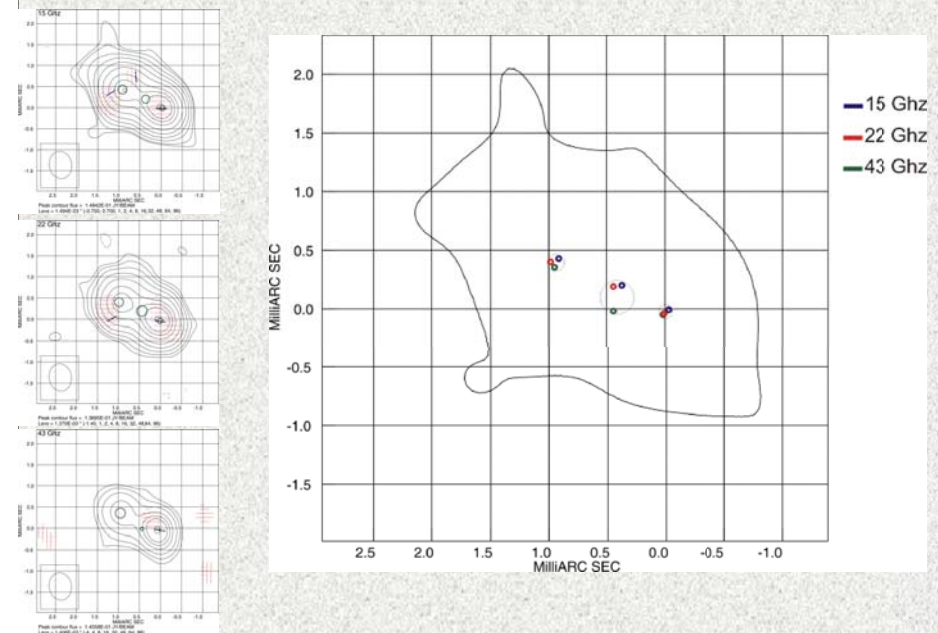
43GHz map
Intensity (mJy)

- 1) 114.2
- 2) 51.5
- 3) 103

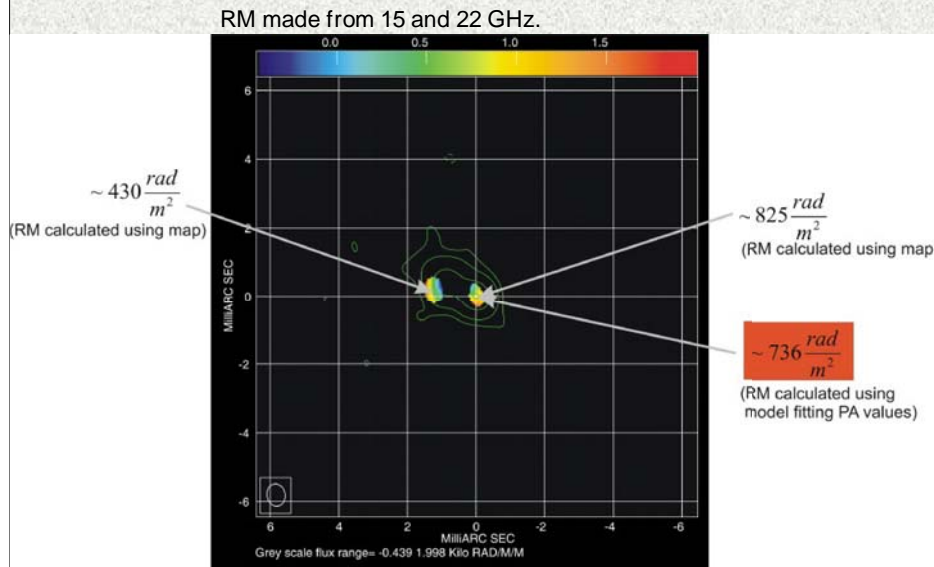
Polarization (mJy)
and PA (deg)

- | | |
|---------|--------|
| 1) 4.09 | 89.146 |
|---------|--------|

0828+493. Model fitting.

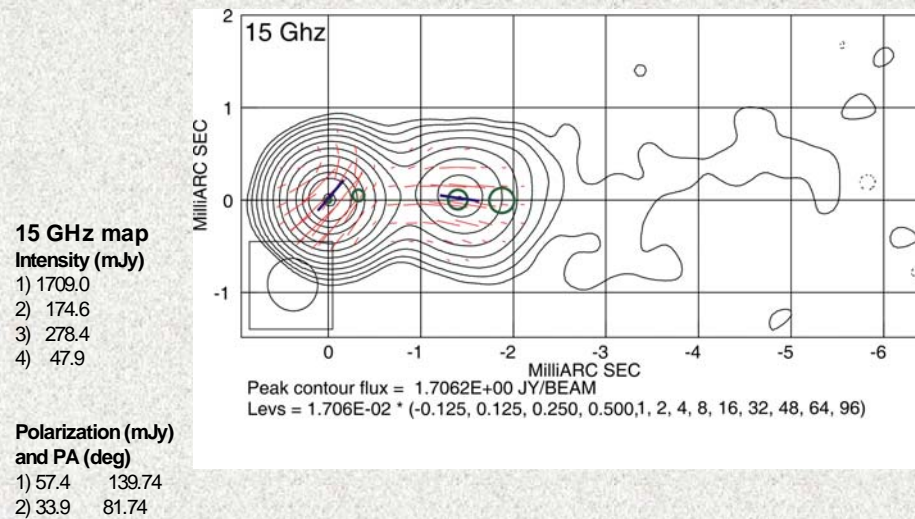


0828+493. Rotation Measure.

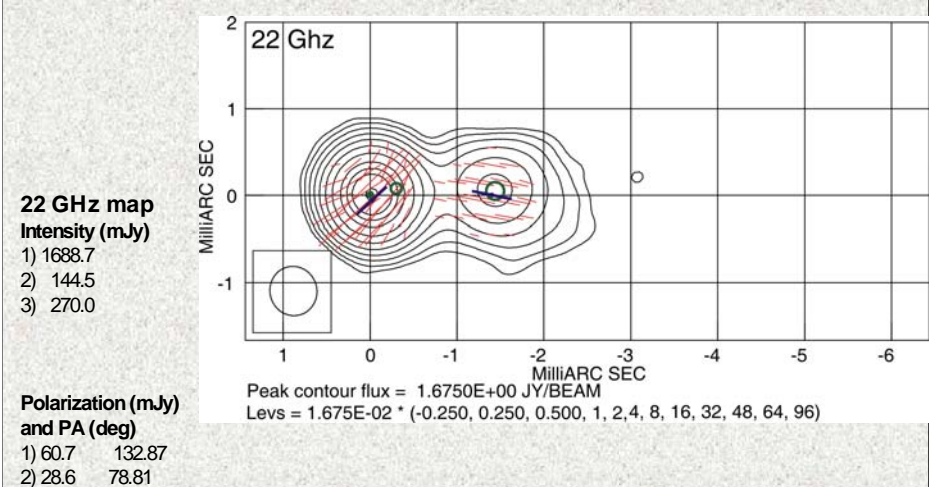


1803+784
(May 2004)

1803+784. Model fitting.



1803+784. Model fitting.



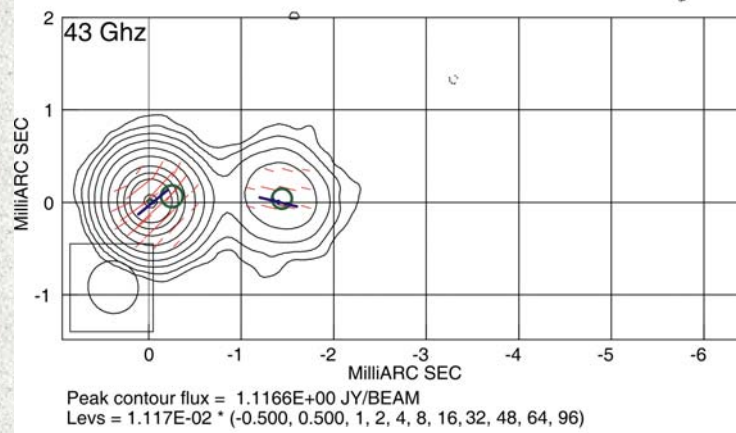
1803+784. Model fitting.

43 GHz map Intensity (mJy)

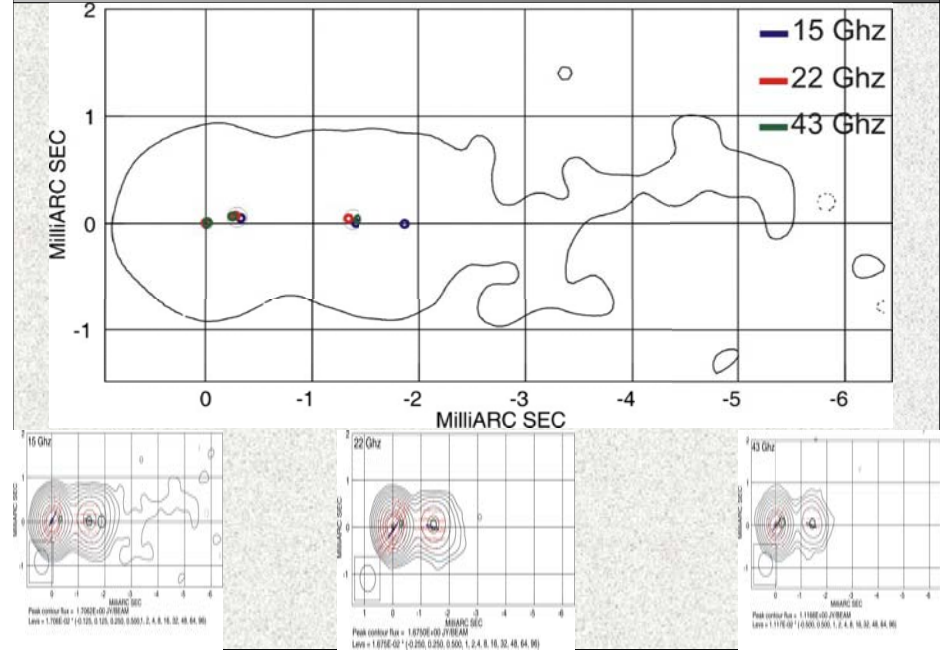
- 1) 1091.0
- 2) 146.0
- 3) 173.0

Polarization (mJy) and PA (deg)

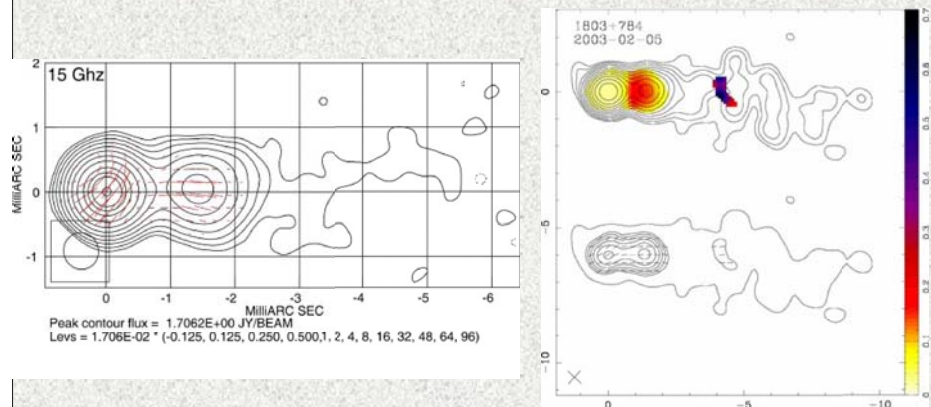
- 1) 37.0 129.65
- 2) 12.7 76.4



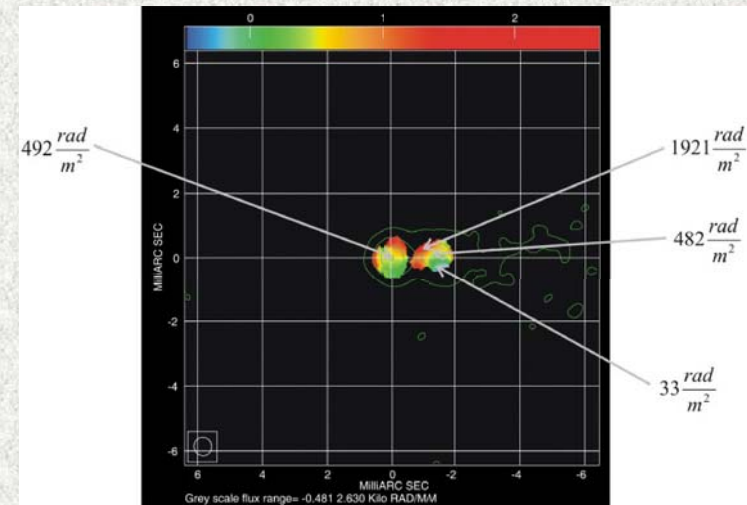
1803+784. Model fitting.



1803+784. May 2002 Epoch compare with MOJAVE data.

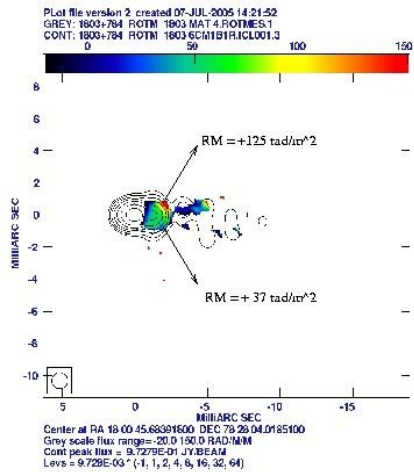


1803+784. Rotation measure.

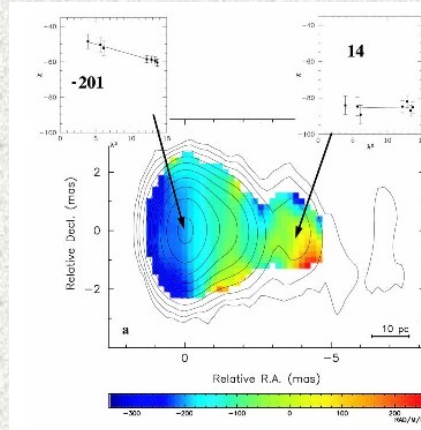


1803+784. Rotation measure..

RM gradient change direction !!!



Mehreen Mahmud image



Zavala and Taylor et. el.

Summary.

- Possibility of Helical magnetic field in these sources
 - 1308+326 : asymmetric total intensity distribution across the jet;
 - 0828+493 : polarization rotates by 90 degrees across the jet;
 - 1803+784 : asymmetric RM distribution across the jet;
- 1308+326 core changes from optically thick in 15 and 22 GHz to optically thin between 22 and 43 GHz which gives rise to polarization degree rotation to 90 in 43 GHz.
- Found asymmetric RM distribution in 1803+784; Asymmetry found to be opposite to previous observations made by Zavala and Taylor;
- Finished analysis for entire set of sources: 17 sources in 3 frequencies;
- Produced and tested version of VISFIT program in Linux (intensity and polarization model fitting);

Acknowledgements to

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